



ISO 8217 2010 FUEL STANDARD

ISO 8217 2010 Fuel Standard
for marine distillate fuels

EXHIBIT 4

REQUIREMENTS FOR MARINE DISTILLATE FUELS

| Characteristic | | Unit | Limit | Category ISO-F- | | | | Test method reference |
|---|----------------|--------------------|-------|-------------------------------|-------|-------|--------------------|----------------------------------|
| | | | | DMX | DMA | DMZ | DMB | |
| Kinematic viscosity at 40 °C ^a | | mm ² /s | max. | 5,500 | 6,000 | 6,000 | 11,00 | ISO 3104 |
| | | | min. | 1,400 | 2,000 | 3,000 | 2,000 | |
| Density at 15 °C | | kg/m ³ | max. | – | 890,0 | 890,0 | 900,0 | see 7.1 ISO 3675 or ISO 12185 |
| Cetane index | | – | min. | 45 | 40 | 40 | 35 | ISO 4264 |
| Sulfur ^b | | mass % | max. | 1,00 | 1,50 | 1,50 | 2,00 | see 7.2 ISO 8754 ISO 14596 |
| Flash point | | °C | min. | 43,0 | 60,0 | 60,0 | 60,0 | see 7.3 ISO 2719 |
| Hydrogen sulfide ^c | | mg/kg | max. | 2,00 | 2,00 | 2,00 | 2,00 | IP 570 |
| Acid number | | mg KOH/g | max. | 0,5 | 0,5 | 0,5 | 0,5 | ASTM D664 |
| Total sediment by hot filtration | | mass % | max. | – | – | – | 0,10 ^e | see 7.4 ISO 10307-1 |
| Oxidation stability | | g/m ³ | max. | 25 | 25 | 25 | 25 ^f | ISO 12205 |
| Carbon residue: micro method on the 10 % volume distillation residue | | mass % | max. | 0,30 | 0,30 | 0,30 | – | ISO 10370 |
| Carbon residue: micro method | | mass % | max. | – | – | – | 0,30 | ISO 10370 |
| Cloud point | | °C | max. | –16 | – | – | – | ISO 3015 |
| Pour point (upper) ^d | winter quality | °C | max. | – 6 | – 6 | – 6 | 0 | ISO 3016 |
| | summer quality | °C | max. | 0 | 0 | 0 | 6 | ISO 3016 |
| Appearance | | – | – | Clear and bright ^j | | | ^{e, f, g} | see 7.6 |
| Water | | volume % | max. | – | – | – | 0,30 ^e | ISO 3733 |
| Ash | | mass % | max. | 0,010 | 0,010 | 0,010 | 0,010 | ISO 6245 |
| Lubricity, corrected wear scar diameter (wsd 1,4) at 60 °C ^h | | µm | max. | 520 | 520 | 520 | 520 ^g | ISO 12156-1 |

^a 1 mm²/s = 1 cSt.

^b Notwithstanding the limits given, the purchaser shall define the maximum sulfur content in accordance with relevant statutory limitations. See Annex C.

^c Due to reasons stated in Annex D, the implementation date for compliance with the limit shall be 1 July 2012. Until such time, the specified value is given for guidance. For distillate fuels the precision data are currently being developed.

^d Purchasers should ensure that this pour point is suitable for the equipment on board, especially if the ship operates in cold climates.

^e If the sample is not clear and bright, the total sediment by hot filtration and water tests shall be required, see 7.4 and 7.6.

^f If the sample is not clear and bright, the test cannot be undertaken and hence the oxidation stability limit shall not apply.

^g If the sample is not clear and bright, the test cannot be undertaken and hence the lubricity limit shall not apply.

^h This requirement is applicable to fuels with a sulfur content below 500 mg/kg (0,050 mass %).

ⁱ If the sample is dyed and not transparent, then the water limit and test method as given in 7.6 shall apply.

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ISO 8217 2010 FUEL STANDARD

ISO 8217 2010 Fuel Standard for marine residual fuels

REQUIREMENTS FOR MARINE RESIDUAL FUELS

| Characteristic | Unit | Limit | Category ISO-F- | | | | | | | | | | | Test method reference | |
|---|----------------|-------|--|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|--|----------|
| | | | RMA | RMB | RMD | RME | RMG | | | | RMK | | | | |
| | | | 10 ^a | 30 | 80 | 180 | 180 | 380 | 500 | 700 | 380 | 500 | 700 | | |
| Kinematic viscosity at 50 °C ^b | mm²/s | max. | 10,00 | 30,00 | 80,00 | 180,0 | 180,0 | 380,0 | 500,0 | 700,0 | 380,0 | 500,0 | 700,0 | ISO 3104 | |
| Density at 15 °C | kg/m³ | max. | 920,0 | 960,0 | 975,0 | 991,0 | 991,0 | | | | 1010,0 | | | see 7.1 ISO 3675 or ISO 12185 | |
| CCAI | — | max. | 850 | 860 | 860 | 860 | 870 | | | | 870 | | | see 6.3 a) | |
| Sulfur ^c | mass % | max. | Statutory requirements | | | | | | | | | | | see 7.2 ISO 8754 ISO 14596 | |
| Flash point | °C | min. | 60,0 | 60,0 | 60,0 | 60,0 | 60,0 | | | | 60,0 | | | see 7.3 ISO 2719 | |
| Hydrogen sulfide ^d | mg/kg | max. | 2,00 | 2,00 | 2,00 | 2,00 | 2,00 | | | | 2,00 | | | IP 570 | |
| Acid number ^e | mg KOH/g | max. | 2,5 | 2,5 | 2,5 | 2,5 | 2,5 | | | | 2,5 | | | ASTM D664 | |
| Total sediment aged | mass % | max. | 0,10 | 0,10 | 0,10 | 0,10 | 0,10 | | | | 0,10 | | | see 7.5 ISO 10307-2 | |
| Carbon residue: micro method | mass % | max. | 2,50 | 10,00 | 14,00 | 15,00 | 18,00 | | | | 20,00 | | | ISO 10370 | |
| Pour point (upper) ^f | winter quality | °C | max. | 0 | 0 | 30 | 30 | 30 | | | | 30 | | | ISO 3016 |
| | summer quality | °C | max. | 6 | 6 | 30 | 30 | 30 | | | | 30 | | | ISO 3016 |
| Water | volume % | max. | 0,30 | 0,50 | 0,50 | 0,50 | 0,50 | | | | 0,50 | | | ISO 3733 | |
| Ash | mass % | max. | 0,040 | 0,070 | 0,070 | 0,070 | 0,100 | | | | 0,150 | | | ISO 6245 | |
| Vanadium | mg/kg | max. | 50 | 150 | 150 | 150 | 350 | | | | 450 | | | see 7.7 IP 501, IP 470 or ISO 14597 | |
| Sodium | mg/kg | max. | 50 | 100 | 100 | 50 | 100 | | | | 100 | | | see 7.8 IP 501, IP 470 | |
| Aluminium plus silicon | mg/kg | max. | 25 | 40 | 40 | 50 | 60 | | | | 60 | | | see 7.9 IP 501, IP 470 or ISO 10478 | |
| Used lubricating oils (ULO): calcium and zinc or calcium and phosphorus | mg/kg | — | The fuel shall be free from ULO. A fuel shall be considered to contain ULO when either one of the following conditions is met: calcium > 30 and zinc > 15; or calcium > 30 and phosphorus > 15 | | | | | | | | | | | see 7.10 IP 501 or IP 470 IP 500 | |

- a** This category is based on a previously defined distillate DMC category that was described in ISO 8217:2005, Table 1. ISO 8217:2005 has been withdrawn.
- b** 1 mm²/s = 1 cSt.
- c** The purchaser shall define the maximum sulfur content in accordance with relevant statutory limitations. See 0.3 and Annex C.
- d** Due to reasons stated in Annex D, the implementation date for compliance with the limit shall be 1 July 2012. Until such time, the specified value is given for guidance.
- e** See Annex H.
- f** Purchasers shall ensure that this pour point is suitable for the equipment on board, especially if the ship operates in cold climates.

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